Meeting Notes
NorthMet Mine Project EIS

Meeting title:	**Hydrology Baseline Meeting**
Date:	December 8, 2010
Location:	USEPA Region 5 Office, Chicago
Facilitators:	Anna Miller/Dave Blaha

Purpose:

- Discuss and resolve questions regarding adequacy of baseline hydrology and water quality data.

Agenda items:

- Introduction
- Mine Site baseline data
- Tailings Basin baseline data
- Wrap up

Draft Alternative update: Draft Alternative will be available within weeks.
Changes at mine site include: reductions in temporary and long-term stockpiles; potential cut-off wall to direct Category 1 runoff into pits; reduction in haul roads; redesign of wastewater collection; plan to handle saturated overburden the same as waste rock, including subaqueous disposal; East Pit mitigation to include water removal to Tailings Basin. Waiting to see revised water modeling to determine if mitigation is needed for West Pit water overflow.

Summary of Issue Resolution:

The meeting focused on USEPA's concerns regarding the adequacy of baseline hydrology and water quality data for the NorthMet EIS. All concerns were raised and the following conclusions were reached:

- ***Additional Baseline Data Needs***
  - Baseflow in the Partridge River – John Coleman raised concern that the groundwater baseflow contribution to the Partridge River was determined using the surface water SWMM model, which may not be very accurate.
    ACTION ITEM – MnDNR will measure baseflow in the Partridge (and Embarrass) River three times over this winter, which is the typical annual low flow period.
    ACTION ITEM – Based on the new low flow data collected by MnDNR, Barr will re-evaluate the groundwater baseflow estimate for the Partridge River.
  - Water quality of West Pit overflow receiving stream – it was pointed out that no data has been collected to characterize the existing water quality of this stream.
    ACTION ITEM – PolyMet should collect sufficient water quality samples from this stream to generally characterize its existing water quality.
  - Better characterize existing groundwater quality north of the Tailings Basin – USEPA recommends that additional data be collected north of the Tailings Basin to help characterize the "plume" from the existing LTV basin.
    ACTION ITEM – PolyMet to collect a second round of water quality samples from the residential wells north of the Tailings Basin to the extent possible.

- ***Possible Additional Baseline Data Needs – further analysis required***
  - Groundwater quality data between the Mine Site and Partridge River – USEPA expressed concern regarding the lack of water quality data in this area. Participants discussed whether rationale for considering the number and location of sampling sites to be representative, how to achieve confidence in

existing data, and whether data from additional sampling sites was needed. Rationale includes: the mine site is a natural system, affected mainly by topography and surface water; no red flags indicated anything other than a natural system, e.g., not a lot of variability; no temporal trends; assuming a straight flow path is a conservative assumption. There was discussion about improving confidence in existing data, such as : preparing a statistical analysis of data (similar to the suggestion forwarded in the geochemistry subgroup); introducing variability in the impact assessment modeling going forward; modeling background with variability; explicit comparisons to other sites. EPA advised that the SDEIS have a good discussion of assumptions and how the assumptions that are made affect the expression of impacts.
ACTION ITEM - Barr will analyze the available data regarding its representativeness and the potential for reasonably expected baseline concentrations to significantly influence predicted future concentrations during and after mining and provide a memo for review by the agencies.
ACTION ITEM - MnDNR will also provide to USEPA an Excel spreadsheet with all available Mine Site water quality data.

- Groundwater levels at the Mine Site – USEPA raised concerns whether adequate groundwater hydrology information is available to adequately evaluate aquifer drawdown from pit dewatering and potential effects on wetlands.
  ACTION ITEM – the Groundwater IAP workgroup will specifically discuss this issue and recommend an approach to evaluate the extent of aquifer drawdown and effects on wetlands.
- Hydromet residue facility – concern was raised as to whether adequate groundwater quality data is available near the relocated proposed hydromet residue facility.
  ACTION ITEM – the Groundwater IAP workgroup will review the available groundwater quality data for the area near the proposed hydromet residue facility and determine whether any additional groundwater quality data are required.

- ***Other Comments and Observations***
  - Straight line groundwater flow paths at Mine Site were determined to be conservative and acceptable.
  - Partridge River low flow estimates were determined to be conservatively low and acceptable for water quality modeling purposes.
  - Water quality modeling downstream of Colby Lake – this area was not modeled previously. USEPA raised concerns that the Mine Site could worsen already occurring exceedences in this reach.
    ACTION ITEM – Surface Water IAP workgroup will evaluate whether the NorthMet Project has the potential to worsen any water quality exceedences in the Partridge River downstream of Colby Lake and if so whether this reach should be included in the surface water quality modeling.
  - Colby Lake water quality – USEPA recommended that MnDNR assemble additional available information regarding the water quality of Colby Lake.
    ACTION ITEM – ERM will determine whether the Hoyt Lakes water treatment plant (which withdraws water from Colby Lake) is meeting drinking water standards and whether they monitor ambient water quality in the lake. This information will be included in the SDEIS.
  - Groundwater drawdown at the Mine Site – John Coleman questioned whether aquifer drawdown may expose previously saturated and potentially reactive overburden or rock to oxidation and potential release of oxidized solute.
    ACTION ITEM – the Groundwater and Geochemistry workgroups will discuss this option and determine whether this issue should be included in the future

groundwater quality modeling and whether any additional baseline data needs to be collected.

- Seepage from the Tailings Basin – John Coleman raised concerns that as the PolyMet Tailings Basin increases in height, some seepage may migrate west and at a minimum displace groundwater in Cell 2W.
  ACTION ITEM – the Groundwater IAP workgroup will ensure that the proposed groundwater modeling at the Tailings Basin takes this into consideration.
- Groundwater conceptual model at the Tailings Basin – the participants wanted to be sure that the water quality and level data from the new wells 13, 14, and 15 be integrated into the groundwater conceptual model.
  ACTION ITEM – Barr to integrate new groundwater data into Tailings Basin conceptual model and ERM will include in the SDEIS.
- Hydraulic conductivity value at the Tailings Basin – concern was raised whether the hydraulic conductivity value used at the toe of the Tailings Basin may be too high. Subsequent discussion suggested that this may actually be a conservative assumption.
  ACTION ITEM – Groundwater IAP Workgroup to review this issue.
- Cleveland Cliffs Consent Decree – USEPA requested that the SDEIS discuss the Cleveland Cliffs Consent Decree and clearly distinguish actions required under the Decree from the PolyMet Project.
  ACTION ITEM – ERM will coordinate with MPCA and ensure the SDEIS clearly describes the Consent Decree and its relationship to the NorthMet Project, particularly how LTV mitigation actions affect NorthMet project actions and analysis, such as impact assessment, NorthMet mitigation alternatives, and long-term management.
- Sulfate loading to the Embarrass River – concern was raised by the bust in the mass balance for sulfate in the Embarrass River, specifically regarding the sulfate contribution from Un-named Creek west of the Tailings Basin.
  ACTION ITEM – Barr will evaluate the mass balance in this area and report back on how it is resolved.
- Groundwater quality north of the Tailings Basin – the agencies agreed that the SDEIS must do a better job in predicting existing and future water quality north of the Tailings Basin taking into consideration potential interactions with the underlying LTV tailings and in the aquifer north of the Tailings Basin.
  ACTION ITEM – the Geochem and Groundwater IAP workgroups will discuss this issue.
- Regarding private wells north of the Taillings Basin: participants sought clarification or discussion of elevated constituents (mainly sulfates), and to what extent private well parameters are or are not indicative of chmistry escaping the LTV basin. (Richard Clark, MPCA, was recognized to be the best person toaddress this question, but was not available for this portion of the call)
- EPA suggests that the lead agencies/applicant prepare an integrated table of all available well data, including any monitoring data, well depth, screened interval, and geology, perhaps with fence diagram or cross section – useful for the ground water subgroup going forward.
- Participants discussed using LTV load in impact analysis going forward.

Action Items:

Action items are listed above in **BOLD CAPITALS.** It is recommended that a follow up meeting/conference call be held in March 2011 to review the status of these action items.

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